

WRS INFRASTRUCTURE & ENVIRONMENT, INC.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

**USEPA REGION II
Emergency and Rapid Response Service
Nelson Galvanizing Site
11-02 Broadway
Long Island City, NY 11106**

Submitted to:

**USEPA REGION II
2890 Woodbridge Avenue, Building 209
Edison, NJ**

Prepared by:

**WRS INFRASTRUCTURE & ENVIRONMENT, INC.
346 S. Warminster Road
Hatboro, PA 19040**

**WRS Project Number:
January 21, 2000**

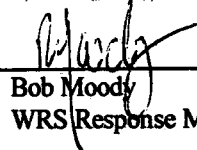
Reviewed by:


Jeff Bechtel
EPA On Scene Coordinator

Date:

1/24/00

Reviewed by:


Bob Moody
WRS Response Manager

Date:

1/24/00

Reviewed by:

Doug Nelson, CIH, CHMM
WRS Health and Safety Manager

Date:

340464

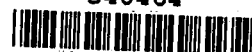


TABLE OF CONTENTS

1.0 INTRODUCTION

- 1.1 Purpose, Scope and Applicability of the Site-Specific Health and Safety Plan

2.0 KEY PERSONNEL AND RESPONSIBILITIES

- 2.1 Key Personnel
- 2.2 Responsibilities

3.0 SITE AND PROJECT DESCRIPTION

- 3.1 Site Description
- 3.2 Removal Activities

4.0 HAZARD ANALYSIS

- 4.1 General Hazard Analysis
- 4.2 Chemical Hazards
- 4.3 Task Specific Hazard Analysis

5.0 PERSONNEL TRAINING REQUIREMENTS

- 5.1 General
- 5.2 Pre-Assignment and Annual Refresher Training
- 5.3 Site Supervisor's Training
- 5.4 Health and Safety Plan Review
- 5.5 Daily Site Safety Meetings

6.0 PERSONAL PROTECTIVE EQUIPMENT

- 6.1 Specific Levels of Protection Planned for the Site
- 6.2 Ensemble Components
- 6.3 Application
- 6.4 Inspection

TABLE OF CONTENTS (Continued)

7.0 MEDICAL SURVEILLANCE REQUIREMENTS

- 7.1 General
- 7.2 Specific Medical Monitoring Measures

8.0 AIR SURVEILLANCE

- 8.1 General
- 8.2 Monitoring During Operations
- 8.3 Perimeter Monitoring
- 8.4 Personal Monitoring Action Limits
- 8.5 Implementation

9.0 SITE CONTROL MEASURES

- 9.1 Control Zones
- 9.2 Site Communications Plan
- 9.3 Sanitation Facilities

10.0 DECONTAMINATION PLAN

- 10.1 Levels of Decontamination Protection Required for Assisting Personnel
- 10.2 Equipment Decontamination
- 10.3 Personnel Decontamination
- 10.4 Disposition of Decontamination Wastes
- 10.5 Emergency Decontamination Procedures

TABLE OF CONTENTS (Continued)

11.0 EMERGENCY RESPONSE PLAN

- 11.1 Pre-Emergency Planning
- 11.2 Personnel Roles and Lines of Authority
- 11.3 Emergency Recognition/Prevention
- 11.4 Emergency Equipment/Facilities
- 11.5 Evacuation Routes/Procedures
- 11.6 Emergency Communications
- 11.7 Emergency Contact/Notification System
- 11.8 Emergency Medical Treatment Procedures
- 11.9 Fire or Explosion
- 11.10 Spill or Leaks

LIST OF APPENDICES

Appendix A	Health and Safety Forms
Appendix B	WRS SOP: "Confined Space Entry"
Appendix C	Material Safety Data Sheets (MSDSs)
Appendix D	WRS SOP: "Drum Handling"

1.0 INTRODUCTION

1.1 PURPOSE, SCOPE AND APPLICABILITY OF THE SITE-SPECIFIC HEALTH AND SAFETY PLAN

The purpose of this Site-specific Health and Safety Plan (HASP) is to identify anticipated hazards and the control measures to be implemented at the Nelson Galvanizing Site in Long Island City, NY, during investigation and remediation activities. The procedures presented in this HASP are based on the best available information at the time of the Plan's preparation and are intended only for the activities described in this Plan.

Applicability of this HASP extends to the EPA representative, all WRS Infrastructure & Environment, Inc. (WRS) employees, and subcontractor employees. This plan must be reviewed by all personnel prior to entering the exclusion zone or contamination reduction zone (decontamination zone). All personnel on site shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the project tasks/operations. This HASP summarizes those hazards in Section 4.0 and defines hazard control measures planned for the site.

All visitors entering the contamination reduction zone and exclusion zone on the Site will be required to read and verify compliance with the provisions of this HASP. In addition, visitors will be expected to comply with relevant OSHA requirements. Visitors will be expected to provide their own personal protective equipment. In the event that a visitor does not adhere to the provisions of this HASP, he/she will be requested to leave the work area.

Revisions to this Plan may be made based on conditions encountered during Site activities. All revisions to this Plan will be documented on a Field Procedures Change Authorization form, approved by the WRS Health and Safety Administrator. A copy of this form is included in Appendix A of the Health and Safety Plan.

The requirements and protocols cited in this Plan were developed in consideration of current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources were consulted in developing this Plan:

- OSHA 29 CFR 1910.120;
- EPA Standard Operating Safety Guides;
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines;
- NIOSH Pocket Guide to Chemical Hazards

2.0 KEY PERSONNEL AND RESPONSIBILITIES

2.1 KEY PERSONNEL

The following personnel have principal responsibility for the implementation and maintenance of health and safety measures during Site remediation activities.

Job Function	Name	Phone	Alternate Phone
ON SITE			
OSC	Jeff Bechtel	(718) 726-4474	
WRS Response Mgr.	Bob Moody	(718) 726-4474	215-588-2488 Cellular
WRS IHSO	Bob Moody	(718) 726-4474	215-588-2488 Cellular
OFF SITE			
WRS Program Manager	Doug Henne	(215) 441-9266	215-588-2488 Mobile 796-0335
WRS H&S Admin.	Doug Nelson, CIH, CHMM	(404) 299-1998	888-341-5150 Pager

2.2 RESPONSIBILITIES

2.2.1 Response Manager

The **Response Manager** is responsible for health and safety "performance" in the field. The Site Response Manager can temporarily halt work at any time if, in his/her opinion, it is necessary to protect the health and well being of Site workers or the general public. Specific responsibilities of the Response Manager include:

- Directing Site activities in accordance with the HASP;
- Being aware of and complying with all applicable federal, state, and local occupational health and safety regulatory requirements;
- Ensuring that resources called for in the HASP and Work Plan/Operations Plan are on Site and operational;
- Verifying that all permits, supporting documentation and clearances for a given task;(e.g., utility surveys, health and safety Plan, confined space entry permits) are in place (See Appendix F for SOP);
- Informing the appropriate Site management and safety personnel of the activities to be performed each day;
- Providing technical advice during routine operations and emergencies;
- Handling field emergency response situations that may arise;
- Correcting unsafe acts and conditions; and
- Participating in pre-job and daily safety meetings.

2.2.2 Site Health and Safety Officer (SHSO)

The Response Manager will serve as the SHSO. The SHSO has responsibility for ensuring that provisions of each HASP are implemented in the field by all WRS employees and subcontractor employees. The SHSO must be trained to implement the requirements in the Site-specific HASP, including the correct use of monitoring instruments, health and safety criteria for the Site, documentation of monitoring results, and actions to take if Site conditions change.

The designated IHSO will continuously evaluate the adequacy of prescribed health and safety procedures and levels of protection against the actual conditions encountered in the field. If an obvious discrepancy exists between the realized hazard(s) and the level of personal protective equipment (either too much or too little), the SHSO will immediately bring the situation to the attention of the WRS Health and Safety Manager (HSM). With the concurrence of the HSM and the Response Manager, the SHSO will take appropriate corrective action. The SHSO has final onsite authority for all matters specifically related to worker health and safety, and emergency situations that require immediate action, including the authority to temporarily cease operations. Additional responsibilities of the SHSO include:

- Monitoring Site activities for unsafe acts and conditions and initiating their correction;
- Monitoring project and Site activities for conformance to the Site-specific HASP;
- Overseeing confined space entries and ensuring that all confined space entries are done in accordance with the requirements found in the WRS Standard Operating Procedures (SOPs) for confined space entry;
- Performing onsite air monitoring and personal sampling as specified in the Site-specific HASP;
- Calibrating instruments;
- Maintaining health and safety equipment and supplies;
- Ensuring that all work-related injuries and illnesses are properly treated and investigated;
- Conducting safety briefings and daily safety meetings;
- Maintaining documentation in support of the HASP; and
- Participating in a pre-job safety briefing with project personnel to discuss anticipated hazards and their control measures.

2.2.3 WRS Health and Safety Manager (HSM)

The WRS Health and Safety Manager (HSM) will be responsible for implementing an effective hazardous waste operations health and safety program, and will have the requisite authority to implement the procedures set forth in the WRS Health and Safety Manual for Hazardous Waste Site Activities, including the authority to temporarily halt work on a project if necessary to protect employees' safety or health. The HSM's primary duties are to serve as a resource to assist every WRS employee and to advise management on health and safety issues. The HSM may delegate certain duties to the IHSO or to other WRS health and safety personnel, but will be ultimately responsible for the following:

- Overseeing the employee medical surveillance program and interacting with examining physicians as required;
- Investigating Site histories, performing Site characterizations, and assessing Site/task specific hazards;
- Developing or assessing task specific monitoring procedures, action levels, levels of personal protective equipment (PPE), and health and safety requirements for the Site and the HASP;
- Performing periodic Site inspections/audits;
- Following to resolution all deficiencies noted during Site inspections; and,
- Resolving "level of care" conflicts that may arise during conduct of the project.

2.2.4 Foremen, Operators, and Technicians

All Site personnel share responsibilities for health and safety. Specific duties include:

- Conducting work in accordance with the HASP;
- Participating in daily safety meetings/planning; and,
- Promptly reporting all incidents and potential health and safety-related problems.

3.0 SITE AND PROJECT DESCRIPTION

3.1 SITE DESCRIPTION

3.1.1 Location and Description

The Nelson Galvanizing Site is located in Long Island City, New York.

3.1.2 Site History

The site is a former galvanizing operation. The building is occupied by an employer not involving the galvanizing operation.

3.2 REMOVAL ACTIVITIES

The following activities will be completed under this removal action:

- Mobilization and Site preparation
- Building Survey for floor holes, and other hazard producing damage ;
- Segregate current occupant from remediation work
- Identify container contents;
- Transfer contents to shipping containers;
- Clean vessels formerly containing galvanizing materials;
- Decontaminate equipment; and,
- Demobilize

4.0 HAZARD ANALYSIS

The evaluation of hazards is based upon the knowledge of Site background information presented in Section 3.1, and anticipated risks posed by the specific tasks/operations to be performed. Section 4.1 presents a general description of Site hazards. Section 4.2 describes the specific hazards associated with each task/activity, and identifies the hazard control measures to be implemented during completion of these tasks.

4.1 GENERAL HAZARD ANALYSIS

Potential Site Hazards:

X	Chemical	X	Trips, slips, falls	X	Machinery/ mechanical equipment
	Radiological		Trenching/ shoring	X	Cutting and welding
	Fire/ explosion	X	Heavy equipment/ vehicular traffic	X	Electrical hazards
	Heat Stress	X	Overhead hazards	X	Confined space entry
X	Uneven terrain (floor holes)			X	Noise

4.1.1 Physical Hazards

No heat or cold stress hazards are anticipated.

4.1.2 Biological Hazards

Biological hazards from flora and fauna are not anticipated due to the developed nature of the site.

4.2 CHEMICAL HAZARDS

Metals and corrosives are anticipated to be present on the site. The metals of concern can include lead and to a lesser extent zinc because of its relatively lower toxicity. Corrosives expected could include sulfuric acid (H₂SO₄).

Health hazard data for PCBs are described in Table 4.1.

TABLE 4-1
SUMMARY OF SELECTED CONTAMINANT HEALTH HAZARDS

SUBSTANCE	EXPOSURE LIMIT (PEL)	IDLH LEVEL	HEALTH EFFECTS	ROUTE OF ENTRY	FIRST AID
Lead	0.05 mg/m ³	700 mg/m ³	Eyes, GI tract, CNS, kidneys, blood, gingival tissue	Inhalation Ingestion	Eye: Irri immed Skin: soap; wash prompt Breath: Resp support Swallow: Med attn Immed
Zinc	15 mg/ m ³	500 mg/ m ³	Irritation of eyes, skin, upper respiratory, cough	Inhalation Ingestion	Eye: irrigate with water Skin: wash with soap and water Breath: respiratory support Swallow: seek medical attention
Sulfuric acid	1mg/m ³	15 mg/m ³	Eye, nose, throat irrit.pulmonary edema, conjunctivitis, skin burns	Inhalation Ingestion Contact	Eye: irrigate immed. Skin: flush with water immed. Breath: resp support Swallow: medical attention immed. do not induce vomiting

4.3 TASK SPECIFIC HAZARD ANALYSIS

Task	Potential Hazard	Precautions
Mobilization	<ul style="list-style-type: none"> • Heavy, manual lifting/moving • Slip/trip/hit/fall • Heavy Equipment • Falling loads 	<ul style="list-style-type: none"> • instruct personnel in proper lifting technique • mechanize repetitious lifts and lifts > 50 lbs when possible • use hand protection such as leather gloves • maintain walkways clear of obstructions. • maintain safe distances • maintain eye contact between ground crew and operator • Stand clear of lifted loads
Site Preparation	<ul style="list-style-type: none"> • Heavy Equipment • Contact with contaminated liquids and/ or solids • Exposure to hazardous atmospheres • Slip and Fall • Heavy, manual lifting/moving • Punctures, scrapes, cuts, sharp, pointed objects 	<ul style="list-style-type: none"> • maintain safe distances • ground traffic maintain eye contact with operator • avoid contact with visible contamination • implement air monitoring plan and ensure PPE usage matches the HASP • implement Site controls (e.g. work zones and decontamination plan) • maintain walking surfaces in an even, unbroken, obstacle free condition • instruct personnel in proper lifting technique • mechanize repetitious lifts and lifts > 50 lbs when possible • use hand protection such as leather gloves

TASK	POTENTIAL HAZARD	PRECAUTIONS
Container Sampling	<ul style="list-style-type: none"> • Slip/trip/hit/fall • Contact with contaminated soils and/or liquids • Exposure to hazardous atmospheres (toxic) • Heavy equipment • Noise 	<ul style="list-style-type: none"> • maintain walkways clear of obstructions/ Cover floor holes • enforce Site work zones and decontamination procedures • avoid contact with visible contamination • implement air monitoring plan and ensure PPE usage matches this HASP • maintain safe distances • maintain eye contact between ground crew and operator • mechanize lifts to extent possible • operators use three point mount/ dismount procedure • utilize hearing protection

TASK	POTENTIAL HAZARD	PRECAUTIONS
Waste Consolidation	<ul style="list-style-type: none"> • Contact with contaminated liquids and/or solids • Exposure to hazardous atmospheres • Incompatibility Reactions 	<ul style="list-style-type: none"> • implement air monitoring plan and ensure PPE usage matches the HASP • implement site controls (eg, work zones and decontamination plan) • Only bulk together streams which been compatibility tested
Vessell Clean-out	<ul style="list-style-type: none"> • Sharps (eg, drum burrs) • Contact with contaminated liquids and/or solids • Exposure to hazardous atmospheres • Pinch points • Crushing • Confined Space Entry 	<ul style="list-style-type: none"> • wear gloves when handling drums • implement air monitoring plan and ensure PPE usage matches the HASP • implement site controls (eg, work zones and decontamination plan) • keep hands out from between drums • do not attempt to "catch" a falling drum • maintain safe distances • follow WRS SOP Confined Space Entry

TASK	POTENTIAL HAZARD	PRECAUTIONS
Equipment Decon	<ul style="list-style-type: none"> • Heavy Equipment • Equipment maintenance • Splash of contaminated liquids • Contact with contaminated liquids and/ or solids • Exposure to hazardous atmospheres 	<ul style="list-style-type: none"> • maintain safe distances • maintain eye contact between ground crew and operator • Follow WRS "Lock Out Tag Out SOP" • use approved eye protection (goggles) • implement air monitoring plan and ensure PPE usage matches the HASP • implement Site controls (e.g. work zones and decontamination plan)
Demobilization	<ul style="list-style-type: none"> • Heavy, manual lifting/moving • Slip/trip/hit/fall • Heavy Equipment • Falling loads 	<ul style="list-style-type: none"> • instruct personnel in proper lifting technique • mechanize repetitious lifts and lifts > 50 lbs when possible • use hand protection such as leather gloves • maintain walkways clear of obstructions. • mark hazardous area (work zone delineation • maintain safe distances • ground crew to maintain eye contact with operator • stand clear of lifted loads

5.0 PERSONNEL TRAINING REQUIREMENTS

5.1 GENERAL

All Site personnel are trained in accordance with OSHA's 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response Standard. At a minimum, all personnel are required to be trained to recognize the hazards on Site, the provisions of this HASP, and the personnel responsible for safety on the Site.

5.2 PRE-ASSIGNMENT AND ANNUAL REFRESHER TRAINING

Prior to arrival on Site, WRS and each subcontractor will be responsible for certifying that his/her employees meet the requirements of preassignment training, consistent with OSHA 29 CFR 1910.120 paragraph (e)(3). WRS and each subcontractor must be able to provide a document certifying that each general Site worker has received 40 hours of offsite instruction. The Industrial Health and Safety Officer will maintain documentation verifying that all OSHA-mandated health and safety training requirements have been met. Any person entering the contamination reduction zone or exclusion zone will have completed a 40-hour training course as required by 29 CFR 1910.120 (OSHA), plus three days of actual field experience under the direct supervision of a trained and experienced supervisor. All personnel must also receive eight hours of refresher training annually.

5.3 SITE SUPERVISOR'S TRAINING

Consistent with OSHA 29 CFR 1910.120 paragraph (e)(4), individuals designated as Site Supervisors receive an additional eight hours of training.

5.4 HEALTH AND SAFETY PLAN REVIEW

Prior to working on the Site, each person will review the HASP and will have the opportunity to ask questions of the Industrial Health and Safety Officer concerning the Plan's contents. After reviewing the HASP, WRS employees and subcontractor employees will sign the HASP Review Sign-Off (Safety Briefing form) located on the last page of this document, before the Appendices.

5.5 DAILY SITE SAFETY MEETINGS

Site safety meetings will be conducted daily. The meeting will cover:

- the work to be completed;
- hazards associated with the work; and,
- hazard control measures to be implemented.

WRS subcontractor employees and their supervisor(s) are required to attend.

6.0 PERSONAL PROTECTIVE EQUIPMENT

This section describes the specific levels of protection required for each task to be conducted at the Site. The general requirements of the EPA designated Levels of Protection (A-D) are described in the WRS Health and Safety Program Manual. The level of protection to be worn by field personnel will be monitored by the IHSO.

6.1 SPECIFIC LEVELS OF PROTECTION PLANNED FOR THE SITE

PPE selection is both task specific and responsive to air monitoring data. Table 6.1 lists task specific PPE levels. These levels are disqualified for use if air monitoring indicates that the upper action limit for the level of protection being used is exceeded.

Table 6.1: Levels of Protection*				
Location	Job Function/Task	Initial Level of Protection**		
Support Zone	Project Management Activities	D		
	Material Storage	D		
Contamination Reduction Zone (CRZ)	Equipment Decontamination	D+		
	Decontamination of personnel	D+		
Exclusion Zone	Open container sampling	D+		
	Closed, unknown container sampling	B		
	Waste Bulking	C		
	Vessell Clean-out	C	D+	

* Level of PPE supported by continuous air-monitoring to ensure upper action limits are not exceeded.

** Initial level of PPE is listed in the left hand column. Potential downgrades are listed in right hand columns

Determination of the appropriate level of protection will be the responsibility of the HSM. The HSM will evaluate work practices, air quality, and other factors in making this determination.

6.2 ENSEMBLE COMPONENTS

The components included in each level of PPE and explanations for their use are presented as follow:

Level B

Level B use is not anticipated.

Level C

Level C will consist of the following items:

- MSA Full face air purifying cartridge respirator with acid gas/ organic vapor/ HEPA combination cartridges (MSA brand GMC-P100)
- Steel-toed boots
- Latex overboots
- Hard hat
- Saranex (liquid resistant) over Tyvek when handling liquid/ sludge corrosives or unknowns
- Tyvek coveralls when handling solids
- Thin mil PVC or latex inner gloves
- PVC outer gloves (neoprene or natural rubber are alternatives)
- Hearing protection when operating open cab equipment, two cycle engines

Level D+

May be appropriate when handling contaminated material which poses no inhalation hazard.

- Hard hat
- Safety glasses/Splash shield
- Steel toed boots
- Latex overboots
- Saranex (liquid resistant) coveralls when handling wet materials
- Tyvek coveralls when handling dry materials
- Thin mil PVC or latex inner gloves
- Nitrile outer gloves
- Hearing protection when operating open cab equipment, and two cycle engines

Level D

This is the basic work uniform and will consist of the following items:

- Hard hat
- Safety glasses/Splash shield
- Steel-toed boots
- Hearing protection when operating open cab equipment, and two cycle engines

Leather or Cotton Work Gloves are to be used when sharp metal edges or other laceration hazards are present, HOWEVER, due to the contact hazards posed by some of the site contaminants, PVC gloves must be worn underneath the work gloves to prevent contact with contaminants.

6.3 APPLICATION

Table 6.1 details the anticipated levels of protection for different tasks; however, Site developments may prompt changes in the levels of PPE. Proper notification of the IHSO, HSM, and WRS Response Manager is required to ensure continued safe operations.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION WILL BE MADE WITHOUT THE KNOWLEDGE AND APPROVAL OF THE HEALTH AND SAFETY OFFICER, THE HEALTH AND SAFETY ADMINISTRATOR, THE WRS INDUSTRIAL HEALTH AND SAFETY OFFICER, THE WRS RESPONSE MANAGER, AND THE EPA OSC.

6.4 INSPECTION

Before personal protective equipment is worn within the exclusion zone, it will be properly inspected by its user. The WRS SOP pertaining to inspection of PPE provides guidelines and a checklist for the visual inspection of respiratory protective equipment and chemical protective clothing. The SOP is located in Appendix E.

7.0 MEDICAL SURVEILLANCE REQUIREMENTS

7.1 GENERAL

WRS utilizes a Medical Monitoring Program designed to determine each employee's health status and fitness (including the ability to utilize respiratory protection) for working on hazardous waste sites. All WRS personnel involved in hazardous waste site activities are required to undergo baseline, annual, and site-specific examinations. WRS utilizes the services of physicians experienced in occupational medicine and the effects of toxic industrial substances. Medical surveillance records for WRS employees are retained for the length of employment plus 30 years.

WRS and subcontractor personnel involved in work activities with potential exposure to contamination by any route of exposure are required to participate in a Medical Monitoring Program. Workers must undergo a pre-work baseline or annual examination no more than 12 months prior to participation in onsite field activities. Workers must undergo follow-up examinations at 12-month intervals, or upon conclusion of the remediation project.

Subcontractors involved in work activities in the contamination reduction zone (decontamination zone) or exclusion zone will provide medical monitoring for their employees and will utilize physicians experienced in occupational medicine and the effects of toxic industrial substances. All WRS employees who are terminating their employment with WRS, whether voluntarily or involuntarily, must undergo an exit physical. The physical exams required as part of the Medical Monitoring Program are described in detail in the WRS Health and Safety Manual for Hazardous Waste Site Activities.

7.2 SPECIFIC MEDICAL MONITORING MEASURES

No site-specific medical monitoring activities beyond Heat Stress monitoring are planned.

8.0 AIR SURVEILLANCE

8.1 GENERAL

This section specifies the surveillance activities that will take place during the project. The air monitoring strategy will be directed towards those constituents which present the greatest potential health hazard.

Surveillance activities will achieve the following objectives :

- Characterize breathing zone (BZ) concentrations of Site contaminants for comparison with Permissible Exposure Limits;
- Determine the appropriateness of respiratory protective equipment;
- Characterize potential offsite emissions; and,
- Monitor the performance of emission control activities.

8.2 MONITORING DURING OPERATIONS

Routine air monitoring will be conducted as a part of daily operations. Guidelines for conducting this monitoring are as follow:

- During daily operations to document Site conditions;
- When the possibility of an IDLH condition or flammable atmosphere has developed;
- When a new task is begun;
- Before and during confined space entry;
- When special or unusual conditions warrant this action as determined by the IHSO; and
- In general, monitoring frequency increases with increasing toxicity, and concentration.

Monitoring will be conducted in the breathing zones of crews members, at work zone perimeters, and at the site's perimeter.

8.3 PERIMETER MONITORING

In addition to breathing zone monitoring with real time instrumentation, real time monitoring will be conducted at the Site's exclusion zone perimeter to monitor for potential releases to the occupied spaces of the building.

8.4 PERSONAL MONITORING ACTION LIMITS

**TABLE 8.1
BREATHING ZONE AIR MONITORING ACTION LIMITS**

MONITORING EQUIPMENT	HAZARD	ACTION LEVEL	ACTION
PID Detector	Volatile Organics	≥ 5 ppm ≥ 50 ppm > 500 ppm	Level C Level B Stop Work
Colorimetric Tubes	Inorganic Gases and Fumes/ Mists to be determined	To be determined	To be determined

*Note: action levels for volatile organics represent measurements above background levels.

8.5 IMPLEMENTATION

The WRS Industrial Hygiene and Safety Officer is responsible for conducting air monitoring consistent with this HASP to include:

- daily calibration of all instruments;
- documentation of calibration, instrument readings and Site conditions/activities during monitoring;
- directing Site activities with regard to results of surveillance activities;
- maintaining accurate documentation of monitoring activities;
- maintaining accurate records of air monitoring results; and,
- communicating results to employees.

9.0 SITE CONTROL MEASURES

9.1 CONTROL ZONES

Upon mobilization, the crew will delineate work zones, (exclusion, contamination reduction, and support) choose an emergency rally point and create a map of the site layout. The map will be inserted in the front of this HASP and posted on the wall of the office trailer.

The Response Manager has been designated to coordinate access control on the work Site. No unauthorized person will be allowed beyond the contamination control line. During all activities in the exclusion zone, the implementation of a buddy system is mandatory. Level B operations require a minimum of three people. Standing orders for the exclusion zone and contamination reduction zone are presented on the following pages.

9.2 SITE COMMUNICATIONS PLAN

Hand signals, radios, and mobile telephones are the modes of communication to be used at the Site. Hand signals will be reviewed by the Site Response Manager with all Site personnel prior to the start of the project and periodically at daily safety meetings. Standard hand signals include:

ACTION	MEANING
Hands around throat	- out of air/can't breathe
Thumbs up	- OK/yes
Thumbs down	- negative, no
Hands on top of head	- need assistance
Grip partner's wrist/waist	- leave area immediately

No one will be permitted to break visual contact while in the exclusion zone or contamination reduction zone. The buddy system will be strictly adhered to. When working in the exclusion zone, personnel will not be allowed to work alone. The buddy system will be in place to provide aid in case of an emergency.

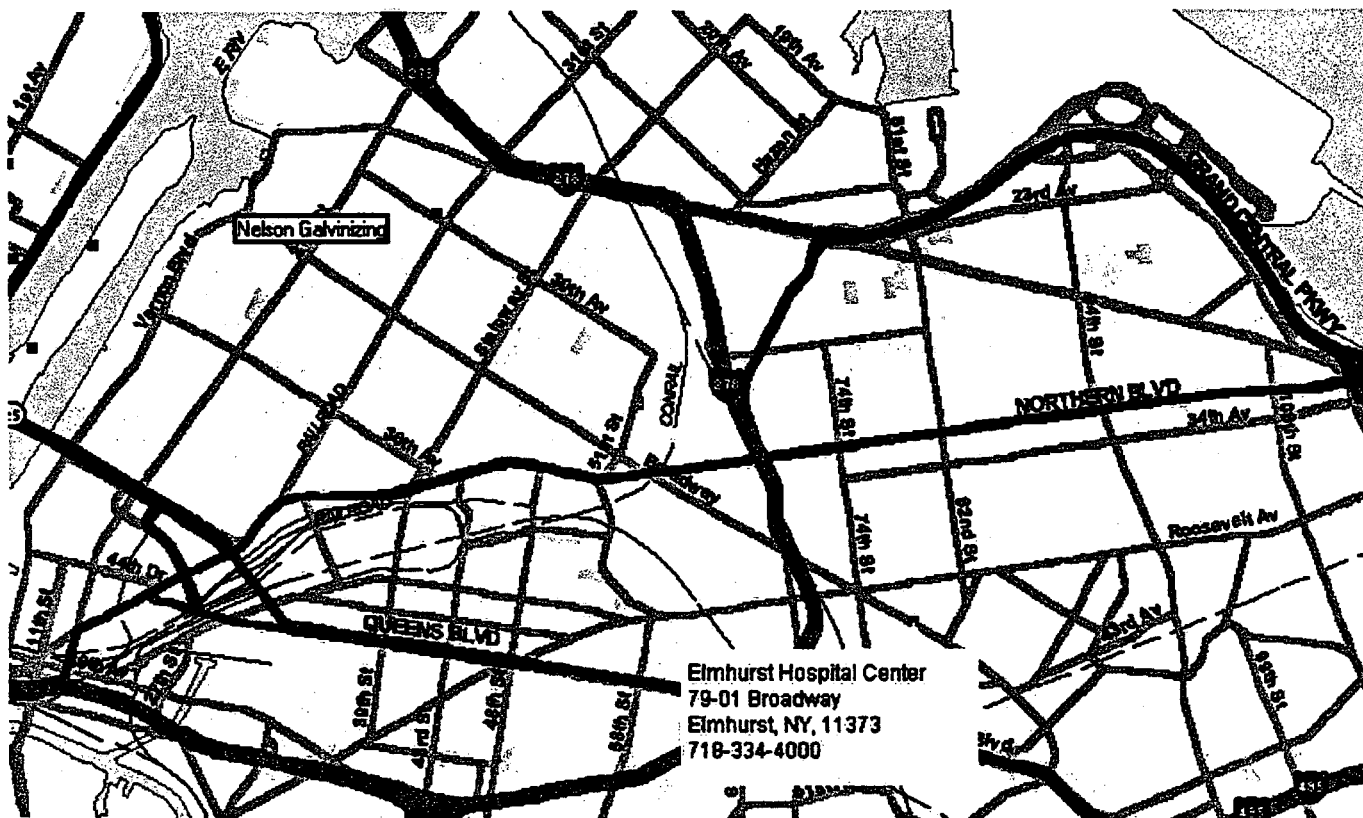
A mobile telephone will be available in the support zone. Emergency assistance telephone numbers will be posted by this telephone. The Response Manager is responsible for the management of communications during normal and emergency operations.

9.3 SANITATION FACILITIES

Sanitation facilities will be located within the support zone.

<i>Standing orders for the exclusion zone and contamination reduction zone are as follows:</i>	
<ul style="list-style-type: none">•	No smoking, eating, or drinking in these zones. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of any material is prohibited in any area designated as a contamination reduction zone or exclusion zone.
<ul style="list-style-type: none">•	No horse play.
<ul style="list-style-type: none">•	No matches or lighters in these zones.
<ul style="list-style-type: none">•	Check-in on entrance to the contamination reduction zone. Check-out on exit from this zone. Entrance and exit locations will be designated and emergency escape routes delineated. Warning signals for Site evacuation have been established.
<ul style="list-style-type: none">•	Implement the communications system. Communications using radios, hand signals, signs, or other means will be maintained between work crew members at all times. Emergency communication will be prearranged in case of radio failure, necessity for evacuation off Site, or other reasons.
<ul style="list-style-type: none">•	Maintain visual contact between exclusion zone entrants.
<ul style="list-style-type: none">•	Wear the appropriate level of protection as defined in the Site-specific Health and Safety Plan.
<ul style="list-style-type: none">•	Work will only be performed during daylight hours unless adequate lighting is available.
<ul style="list-style-type: none">•	Contact with known or suspected contaminated surfaces should be avoided. Whenever possible, there will be no walking through puddles or discolored surfaces; kneeling on ground; or leaning, sitting or placing equipment on drums, containers, or the ground.
<ul style="list-style-type: none">•	Prescribed drugs should not be taken by personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician.
<ul style="list-style-type: none">•	All respirator wearers must be certified as being capable of wearing respiratory protection (physician's approval, fit tested) while performing their assigned tasks. All respirator wearers must have been fit tested, within the past 12 months, with the make and size respirator to be worn. No facial hair is allowed that would interfere with respirator fit.
<ul style="list-style-type: none">•	Work areas for all operational activities will be clearly established and clearly delineated in the Site-specific Health and Safety Plan.
<ul style="list-style-type: none">•	Work areas and decontamination procedures will be established based on expected Site conditions and clearly delineated in the Site-specific Health and Safety Plan.

Personnel and equipment in the exclusion zone(s) will be minimized, consistent with effective Site operations.



10.0 DECONTAMINATION PLAN

Decontamination of equipment and personnel will be performed to limit the potential migration of contaminants outside the exclusion zone. All equipment and personnel will be decontaminated prior to leaving the exclusion zone.

10.1 LEVELS OF DECONTAMINATION PROTECTION REQUIRED FOR ASSISTING PERSONNEL

The level of protection required for personnel assisting with decontamination will be Level "C". The Industrial Hygiene and Safety Officer is responsible for monitoring decontamination procedures and determining their effectiveness. Personnel performing heavy equipment decontamination will wear Level D+ PPE.

10.2 EQUIPMENT DECONTAMINATION

10.2.1 Sampling Equipment

Sampling equipment will be decontaminated in accordance with the project's Site-Sampling and/ or QA Plan. Decontamination fluids will be collected, characterized and disposed according to the Site Work Plan. A sampling equipment decontamination area will be established which will prevent the release of contaminated decontamination fluids.

10.2.2 Heavy Equipment

Decontamination of heavy equipment will consist of physical removal of soils and debris with shovels and brushes then pressure washing. Equipment decontamination will take place on a decontamination pad in a temporary decontamination zone to be established periodically within the support zone.

10.3 PERSONNEL DECONTAMINATION

10.3.1 Procedure

All Site personnel should minimize contact with contaminants in order to reduce the need for extensive decontamination. Personnel decontamination will be conducted in the decontamination zone. Gross decontamination for PPE Levels B, C and D+ will include:

1. Remove outer coveralls and dispose
2. Remove boot covers and dispose or decontaminate and stage for re-use
3. Remove outer gloves and dispose or decontaminate and stage for re-use
4. Remove respirator (dispose of cartridges daily or when breakthrough occurs)
5. Wash/rinse respirator (inside and out) and hang for drying
6. Rinse hard hat (inside and out)
7. Remove inner coverall (if applicable)
8. Remove inner gloves and dispose

Personal hygiene following decontamination will take place in the support zone.

10.3.2 Equipment

Personal decontamination equipment will consist of wash tubs, garden sprayer, trash cans with liners (for disposable PPE), three-gallon containers (respirator wash, sanitize and rinse), brushes, water supply, and detergent. Boot, glove and respirator cleaning and rinsing solutions will be changed at least daily.

10.4 DISPOSITION OF DECONTAMINATION WASTES

All equipment used for decontamination will be decontaminated or disposed of properly. Aqueous liquids will be characterized and disposed according to the Site Work Plan. All disposable PPE will be containerized and properly disposed.

10.5 EMERGENCY DECONTAMINATION PROCEDURES

Section 11.8 details emergency decontamination procedures.

11.0 EMERGENCY RESPONSE PLAN

This Emergency Response Plan has been prepared to define the responsibilities, resources and actions necessary to respond to uncontrolled releases of contaminated materials and injury to personnel.

11.1 PRE-EMERGENCY PLANNING

This Emergency Response Plan will be reviewed and revised on a regular basis (if necessary) by the IHSO. This will ensure that the Plan is adequate and consistent with prevailing Site conditions.

During the daily safety meetings, all employees will be trained in and reminded of the provisions of the Emergency Response Plan, communication systems, and evacuation routes.

Local emergency medical, fire, and police resources have been identified, and the fire and police departments have been notified. As soon as possible after mobilization to the Site, the WRS RM and EPA OSC will coordinate operations with the local emergency response teams.

11.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The OSC and RM have primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of Site personnel and the public. Possible actions may involve evacuation of personnel from the Site area, and notifying local authorities for the evacuation of adjacent residents. The RM and OSC are additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified and follow-up reports completed. The IHSO may be called upon to act on the behalf of the OSC and will direct responses to any medical emergency.

The individual subcontractor organizations are responsible for assisting the OSC and RM in his/her mission within the parameters of their scope of work.

11.3 EMERGENCY RECOGNITION/PREVENTION

Section 4.0 identifies the chemical and physical hazards on Site. Additional hazards that may result from Site activities are listed in Table 11.1. This table also lists prevention and control techniques/mechanisms. Personnel will be familiar with techniques of hazard recognition from preassignment training and Site-specific briefings. The IHSO is responsible for ensuring that prevention devices or equipment are available to personnel.

Table 11.1: Emergency Recognition/Control Measures		
Potential Hazard	Prevention/Control	Location of Response Equipment
Fire	<ul style="list-style-type: none"> Fire Extinguisher (15 lb dry chemical) 	<ul style="list-style-type: none"> Exclusion zone Decon zone Office area Break area All fuel storage areas
	<ul style="list-style-type: none"> Fire Extinguisher (5 lb dry chemical) %LEL monitoring Ignition source control Hot work permit 	<ul style="list-style-type: none"> Heavy equipment As needed All areas Welding or cutting locations
Spill	<ul style="list-style-type: none"> Berms/Dikes Sorbent Materials (vermiculite for unknowns and oxidizers) Visqueen 	<ul style="list-style-type: none"> Storm water drains Around drum storage areas Around Fuel storage area CRZ area Next to potential release points
Air Release <ul style="list-style-type: none"> Gas/ Fume /Mist 	<ul style="list-style-type: none"> Cover releasing container Sound evacuation 	<ul style="list-style-type: none"> Air horn in the exclusion zone, next to potential release points

11.4 EMERGENCY EQUIPMENT/FACILITIES

The following emergency equipment will be maintained on Site within the Support Zone.

- First aid kit
- Fire extinguishers
- Telephone
- Eye wash/ Emergency wash facilities

The following safety equipment and materials will be maintained on Site, near the exclusion zone:

Safety Equipment

Number	Item
1	Industrial First Aid Kit w/ chem. burn treatment
1	Portable Eye Wash and wash facilities to be maintained in the support area (in support zone) (15 minutes to flush)
1	Air Horn

11.5 EVACUATION ROUTES/PROCEDURES

In the event of an emergency which necessitates an evacuation of the Site, the following procedures will be implemented:

Evacuation alarm notification should be made using one long blast on the air horn. All personnel should evacuate upwind of any activities. A predetermined offsite location (rally point) has been identified for a personnel head count in case of an emergency.

Personnel will be expected to proceed to the closest exit with their buddy, and mobilize to the safe distance area associated with the evacuation route. Personnel will remain at that area until the Response Manager or IHSO provides further instructions.

11.6 EMERGENCY COMMUNICATIONS

At the work Site, an air horn will be made available to sound one long blast if evacuation of the work area is required.

The following hand signals will be recognized by each Site worker:

Signal	Meaning
Grip partner's wrist	Leave area immediately and report to staging area
Hand on top of head	Need assistance
Thumbs up	OK; I'm all right, I understand
Thumbs down	No; negative
One long blast	Evacuate work area

11.7 EMERGENCY CONTACT/NOTIFICATION SYSTEM

Spills of contaminated liquids or solids on Site will immediately be reported to the OSC and WRS RM. Spills which are potentially reportable include:

1. Quantities sufficient to produce a sheen, discoloring, or potential contamination of Site waters
2. Liquid quantities which produce surface "pooling" or "puddling" effects
3. Solids misplaced during handling or transport operations

Notification requirements may include the following:

1. A Site meeting with On-Scene Coordinator
2. A telephone call to the National Response Center in Washington, D.C. or to the appropriate State of New Jersey officials if the spill has the potential to affect the surrounding population.

If necessary, the WRS Site Representative will provide the following information to federal and state authorities:

1. Name, address, and telephone number of person reporting
2. Details regarding the party responsible for the incident
3. Date and time the incident occurred or was discovered
4. Specific location of the spill
5. Name of material spilled or released
6. Source of spilled material
7. Estimated quantity spilled or discharged
8. Cause of the release
9. Weather conditions
10. Number and type of injuries or fatalities (if applicable)
11. Whether evacuations have occurred
12. Estimated dollar amount of property damage
13. Description of cleanup action taken and future plans

Federal and state laws require immediate notification upon discovery of a spill or following timely spill source control, containment, and countermeasures. However, spill source control and initiation of spill containment activities may at times take priority over notification of federal and state authorities.

Table 11.2 provides names and telephone numbers of emergency assistance organizations. A copy of this table will be posted and or located at the Command Post. In the event of a fire or spill, the Site Response Manager will notify the WRS representative who will then notify the appropriate local, state, and federal agencies. In the event of a medical emergency, personnel will take direction from the IHSO and notify the appropriate emergency organization.

Table 11.2: Emergency Assistance Telephone List	
Emergency Assistance Organization	Telephone Number
Elmhurst Hospital Center 79-01 Broadway Elmhurst, NY 11373	718-334-4000
Ambulance/Rescue Squad	911
Fire	911
State Police	911
WRS Headquarters	(813) 620-1432
WRS Response Manager	215-441-9266
WRS H&S Manager	(404) 299-1998
EPA Emergency Response Team	(732) 321-6660
Center for Disease Control	(404) 639-3311
WRS 24-hour Emergency Number	(800) 358-4135
EPA (RCRA - Superfund Hotline)	(800) 424-9346
National Response Center (NRC) (Oil/Hazardous Substances)	(800) 424-8802
National Pesticide Telecommunications Hotline	(800) 858-7378

11.8 EMERGENCY MEDICAL TREATMENT PROCEDURES

Any person who becomes ill or injured in the exclusion zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered.

In the event of an injury requiring more than minor first aid, or any employee reporting any sign or symptom of exposure to hazardous substances, immediately take the victim to a local emergency medical provider. In the event of life-threatening or traumatic injury, implement appropriate first aid and immediately call for emergency medical assistance. If the patient's

condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid should be administered while awaiting an ambulance or paramedics.

When an individual is being transported to a clinic or hospital for treatment, the Response Manager, or IHSO should ensure that information pertaining to the chemical(s) involved is available to medical personnel. This information; which is included in Section 4.0, could also be given to the hospital during Site set-up activities. Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

Directions to Elmhurst Hospital

***** Please see Figure 11.1 *****

Make a right onto Broadway from the site follow Broadway to Elmhurst Hospital

11.9 FIRE OR EXPLOSION

In the event of a fire or explosion, the local Fire Department should be summoned immediately. Upon their arrival, the Response Manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on Site.

The IHSO will act as the designated Site emergency coordinator and will have final authority for initial response to onsite emergency situations. Upon arrival of the appropriate emergency response personnel, the IHSO will defer all authority but will remain on the scene to provide assistance, if necessary. At the earliest opportunity, the IHSO will contact the Response Manager.

11.10 SPILL OR LEAKS

In the event of a spill or a leak, Site personnel will:

- Inform the Response Manager immediately
- Locate the source of the spillage and stop the flow if it can be done safely
- Begin containment and recovery of the spilled materials
- Report the incident to WRS management for further instructions

If a spill occurs and safe re-entry is possible, containment procedures will begin. Simultaneously, the source of the spill will be stopped if it is still releasing material. Once containment is complete, cleanup will begin. The priority for containment and cleanup will be the prevention of material reaching surface waters. The WRS Representative will be responsible for any reporting procedures that are required as a result of the spill.

FIGURE 11-1

SITE HEALTH & SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand and will abide by the procedures set forth in the Health and Safety Plan for the EPA/ Nelson Galvanizing Site. I understand that failure to comply with the letter and intent of this plan may subject me to disciplinary action or dismissal.

<u>Printed Name</u>	<u>Signature</u>	<u>Representing</u>	<u>Date</u>
Mabel Mark	<i>Mabel Mark</i>	WRS	1/24/00
Nick Rusyn	<i>Nick Rusyn</i>	ARTC	1-24-00
Jeff M. Bechtel	<i>Jeff M. Bechtel</i>	USEPA	1/24/00
Dan Connell	<i>Dan Connell</i>	WRS	1/24/00
Al Olmedo	<i>Al Olmedo</i>	ARTC	1/24/00
Sherr. Freund	<i>Sherr. Freund</i>	WRS	1/24/00
Bob Moody	<i>Bob Moody</i>	WRS	1/24/00

Appendix A
Health and Safety Forms

WRS Infrastructure & Environment, Inc.
DAILY SAFETY MEETING

Date: _____ Job Name: _____

1. Work to be completed: _____

2. Hazards Associated with this work: _____

3. Hazard control measures to be implemented: _____

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: _____

Chemical Hazards: _____

Physical Hazards: _____

Emergency Procedures: _____

ATTENDEES

NAME PRINTED

SIGNATURE

Meeting Conducted by: _____

**WRS Infrastructure & Environment, Inc.
Air Monitoring Log**

Project Site:	Project No.	Date:

Level of Protection:	

Description of Site (e.g. weather, temp., soil conditions):

Instrument:	Instrument Response:	Location:	Time:	Comments:

Calibration Data (e.g. type & gas concentration, instrument adjustments if any):

Additional Notes:

Signature: _____
(Health and Safety Officer)

Date: _____

Appendix B

WRS SOP: "Confined Space Entry"

CONTENTS

- 1.0 **PURPOSE**
- 2.0 **SCOPE**
- 3.0 **DEFINITIONS**
- 4.0 **RESPONSIBILITIES**
- 5.0 **PROCEDURE**
- 6.0 **REFERENCES**
- 7.0 **ATTACHMENTS**
- 8.0 **RECORD KEEPING**
- 9.0 **EQUIPMENT**

Revised March 1, 1995

CONFINED SPACE ENTRY PROCEDURE

1.0 PURPOSE

The Confined Space Entry Procedure defines which areas are to be considered confined spaces at WRS sites and establishes mandatory practices to be followed by WRS employees and WRS subcontractor personnel when working in confined spaces.

2.0 SCOPE

This applies to all WRS personnel involved in:

- the identification of confined spaces;
- the evaluation of potential hazards in each confined space;
- the issuance of permits for work in confined space;
- the performance of work in confined space; and,
- the monitoring of confined space work as an attendant.

Protocol Application. This protocol provides guidelines to help employees recognize and reduce the risks associated with confined space entry and applies to the following:

- All WRS operations and employees, both permanent and casual.
- Operations conducted by outside organizations and subcontractors under the direction of WRS.
- It does not apply at non-WRS locations where the WRS employee or subcontractor is required to follow site safety rules which provide for a different but equivalent procedure for confined space entry.

3.0 DEFINITIONS

Confined Space

OSHA Standard 29 CFR 1910.146 defines a confined space as an enclosed area which:

- Is large enough for a person to bodily enter to do assigned work;
- Has limited or restricted means for entry or exit; and/ or,
- Is not designed for continuous occupancy.

Confined spaces include enclosures having limited means of access and egress such as, but not limited to:

- Storage Tanks, Vessels, Storage Bins, Silos, Hoppers, Vaults, Sewers, Tunnels and Pipelines.
- Open topped spaces of more than five feet in depth such as pits, vaults and vessels not subject to ventilation are considered permit confined spaces.

A non-permit required confined space is a confined space which does not contain, or does not have the potential to contain, a hazard capable of causing death or serious physical harm.

Permit-Required Confined Space

A permit-required confined space is a confined space that has one or more of the following characteristics:

- A potentially hazardous atmosphere;
- Contains material which may engulf an entrant;
- Has inward sloping walls (such as in a silo or bunker); and/ or,
- Contains any other serious safety and health hazard stemming from mechanical systems, chemical exposures and so on.

The hazards associated with each confined space must be identified. The confined space checklist, entry permit and entry permit log must be completed for each entry into a permit space. Refer to Attachments 1, 2, and 4.

Confined Space Hazards

1. Oxygen Deficiency

A minimum oxygen concentration is necessary to sustain life. Excess concentrations of oxygen will cause combustible and flammable materials to burn uncontrollably. Oxygen concentrations should be measured before entry into all confined spaces and be maintained at 19.5 to 23.5%.

2. Carbon Monoxide

Carbon monoxide is an odorless gas which displaces oxygen in the air and causes asphyxiation in higher concentrations. Carbon monoxide is caused by incomplete combustion of organic material and is a hazard of confined spaces that contain a combustion process. The OSHA PEL for carbon monoxide is 50 ppm.

3. Hydrogen Sulfide

Hydrogen sulfide paralyzes the respiratory system and causes chemical asphyxiation. It is a gas that smells like rotten eggs at low concentrations but may not be sensed by smell at high concentrations. If an employee enters a dangerous atmosphere of hydrogen sulfide, he will smell it at first but the sense of smell will quickly be disabled. The gas can be generated from the decay of organic materials which contain sulfur. Hydrogen sulfide is a potential hazard in all sumps and manholes. The OSHA PEL value is 20 ppm C. The "C" notation means that an individual may not be exposed above the PEL at any time.

4. Hot Work

Hot work is any operation which could provide a source of ignition such as welding, cutting, burning or heating, or open electrical circuits. Hot work is frequently required for repair, installation or demolition projects. All hot work is controlled by a hot work permit as specified in procedure HSSOP 22.0.

5. Chemical Hazards

Chemical hazards include process chemicals which may be present in pipes or vessels. This may include acids and caustics which are used for water or exhaust treatment. If chemical hazards are present, pipes should be blocked off, vessels should be drained or purged and the area ventilated. Direct reading indicator tubes may be used to measure concentrations of acid or volatile organic compounds.

6. Hot Materials

Hot materials may include gases, liquids, or solids. All portions of the combustion process, steam generation and exhaust gases may involve contact with hot materials. If hot process liquids or gases are present, vessels and pipes must be drained and purged and pipes should be blanked. If the confined space involves a hot environment such as the boiler or bag house, the area must be cooled before entry.

7. Engulfment

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided solid substance. Engulfment may occur in an unshored trench, a silo or other storage vessels. The hazard is significant if an employee enters the vessel or silo to free bridged or caked material. Entrants into silos or vessels should wear a body harness attached to a life line, if such actions pose a risk of engulfment.

8. Entrapment

Entrapment may occur if a person is working inside a silo or hopper and is trapped by the inward sloping walls such as in the interior of a cone or funnel. Body harnesses and lifelines are required for entrants into an entrapment hazard area.

9. Mechanical Hazards

Mechanical hazards include crushing, bumping, lacerations or entanglement in the machinery inside a confined space. All mechanical hazards must be controlled by the lockout-tagout system. The entrant into a space should retain keys to all locked out equipment.

10. Flammable/Explosives Atmospheres

Flammable or explosive hazards may occur where there are flammable liquids or gases contained in drums, excavations, or storage tanks. Potentially flammable atmospheres must be tested prior to entry. The concentration of flammable vapors or gases must be less than 10% of the lower flammable limit (LFL) before entry into the space can proceed. Purge or ventilate the area until this limit is reached and ventilate/ monitor continuously if the potential for re-generation of the flammable atmosphere exists.

4.0 RESPONSIBILITIES

4.1 Site Health and Safety Officer (SHSO) (in the absence of a full time SHSO, the Site Supervisor assumes the responsibilities of the SHSO)

- a. Identifies hazards and determine the severity of hazards in each confined space.
- b. Establishes controls to ensure permit spaces can be entered safely.
- c. Prepares a written permit and checklist to control all entry into permit spaces.
- d. Ensures required training has been conducted.
- e. Posts signs near permit spaces to prevent unauthorized entry, except manholes which are all considered confined spaces. Protect entrants from external hazards by signs and barriers.
- f. Provides and maintains the use of any equipment necessary for safe entry and rescue.

4.2 Site Supervisor

- a. Directs applicable site activities in accordance with this SOP.
- b. Ensures procedures and equipment necessary to rescue entrants are implemented.

Confined Space Entry

- c. Makes arrangements for outside emergency services.
- d. Ensures that entries are made under a permit when necessary.
- e. Ensures attendants are stationed at all confined spaces during authorized entries.
- f. Assigns an entry supervisor with responsibility of ensuring all requirements of the Confined Space Program and Procedures are met for each entry.
- g. Ensures that the Confined Space Permit is posted in the proper location.

4.3 Attendant (Safety Standby Person)

- a. Continuously maintains an accurate count of all persons in the space.
- b. Recognizes potential permit required spaces and monitors hazards inside and outside the permit space to verify that the space remains safe for entry.
- c. Maintains continuous contact with authorized entrants.
- d. Orders evacuation of the permit space when a condition not allowed in the permit occurs, when entrants exhibit behavioral effects of a hazardous exposure, when there is an uncontrolled hazard inside or outside the confined space or when the attendant must leave the area.
- e. Summons rescue and emergency services as necessary.
- f. Prohibits unauthorized individuals from entering a confined space.

5.0 PROCEDURES

All WRS personnel whose work is covered by this SOP receive training in the recognition of confined spaces, hazards associated with those spaces and the effective implementation of this SOP for the control of confined space entry hazards prior to their participation in any activity covered under the SOP.

- 5.1 All permit required confined spaces are to be marked with a sign. "Danger Permit Required Confined Space Do Not Enter-- Air Monitoring & Entry Permit Required" (Attachment 3).
- 5.2 All permit confined spaces require a standby observer (attendant) who must be in visual or voice contact at all times with entrants inside the confined space.
- 5.3 An entry supervisor must be designated as the responsible person for an entry. If entry supervisors change during an entry, each supervisor must sign the permit. The attendant must be knowledgeable of the hazards associated with the space and must understand his responsibilities and duties.
- 5.4 Permits are valid for one operating shift or for the duration of the operation. Air must be retested and the permit reissued for the next shift. If a second entry supervisor requests an entry into a

space for a different operation, a second permit must be requested. If additional personnel are to be added to an existing permit for the same operation the additional personnel can be added with the permission of the Site Supervisor.

- 5.5 Smoking is not permitted in a confined space.
- 5.6 Entry into confined spaces is restricted. The Site Supervisor will verify that the entry supervisor, the entrants, and the attendants have been properly trained. Refer to training requirements. This includes WRS and contractor personnel.
- 5.7 If the space to be entered could be pressurized, filled with steam, liquid or contains equipment that has potentially rotating parts, the entry supervisor, along with the Site Supervisor, ensures the system is rendered safe, tagged and locked out in accordance with the WRS Lockout/ Tagout SOP. Keys will be retained by the appropriate personnel as specified in the SOP.
- 5.8 If the confined space could be filled with hazardous materials from associated piping or ducting, the space is isolated by removing a valve, spool piece or expansion joint as close as possible to the space and blanking or capping the open end of the pipe leading to the confined space.
- 5.9 The potential hazards, appropriate tests and control measures in confined spaces are summarized below.

Hazard	Tests	Control Measures
Oxygen deficiency (<19.5%) or Enrichment (> 23.5%)	Oxygen Percentage (%O ₂)	Ventilate area with fresh air
Carbon monoxide	%O ₂ & CO	Ventilate area with fresh air
Hydrogen Sulfide	H ₂ S	Ventilate area with fresh air

Hazard	Tests	Control Measures
Other Chemicals	Specific for chemical if available. (Consult H&S personnel)	Lockout/ Tagout piping, cap off lines, or neutralize chemical, ventilate area
Hot materials or environment	Temperature	Lockout piping, cap, cool space with ventilation
Engulfment	NA	Shoring of trenches, use safety harnesses for rescue
Mechanical	NA	Lockout/ Tagout process or equipment
Flammable/ Explosive	% LEL (≥ 10% LEL entry is not permitted)	Lockout/ Tagout, air monitoring, drain systems, ventilate with fresh air
Entrapment	NA	Safety harnesses for rescue

- 5.10 The designated entry supervisor must request the entry permit from the Site Supervisor.
- 5.11 The Site Supervisor will evaluate what hazards are present and the testing and controls that are appropriate. All hazards potentially present must be controlled or other appropriate protective measures must be implemented. This includes lockout and de-energizing of mechanical, electrical and chemical system, ventilating enclosed spaces, provision of respiratory protection, etc.
- 5.12 The Site Supervisor will review the need for respiratory protection (Refer to the Respiratory Protection Procedure), safety harnesses, rescue equipment, etc.
- 5.13 The Site Supervisor sends a qualified employee to test the confined space for oxygen first, then toxics (e.g. carbon monoxide, hydrogen sulfide, etc.) and accumulation of flammable gases/vapors as appropriate. Results are recorded on the Permit form or on the WRS Atmospheric Monitoring Log.

The acceptable atmospheric conditions for entry are:

- Lower Explosive Limit (LEL) % (combustible gas) must be less than 10%.
 - Oxygen must be greater than 19.5% and not more than 23.5%.
 - Concentrations of toxic gases/ vapors/ dusts/ mists/ fumes must be less than the PEL for the compound when no respiratory protection is used and must be less than the Maximum Use Concentration (PEL X Assigned Protection Factor) of the respirator chosen to complete the work. (Contact the WRS H&S manager if you need assistance choosing respiratory protective equipment for confined space entry work.)
 - No WRS employee may enter into an IDLH atmosphere without the written approval of the WRS H&S Manager.
- 5.14 If any of the limits in Procedure 5.13 are not met, an Entry Permit is not issued. The confined space is ventilated with fresh air using fans or portable blowers until the specified limits are met.
 - 5.15 When the levels of oxygen, flammable gases, carbon monoxide, hydrogen sulfide and/or other chemicals are within the specified limits, the person performing the test completes the "sampling equipment used" and "test conducted" section of the Confined Space Entry Permit (Attachment 1).
 - 5.16 When the Site Supervisor is satisfied that the space is safe to enter, he signs the Confined Space Entry Permit and completes the Confined Space Entry Permit Log (Attachment 2). The entry supervisor lists all approved entrants and authorized safety observers on the Log. The entry supervisor verifies that all actions and conditions necessary for safe entry have been performed and signs the permit.

- 5.17 The permit is posted by the access to the confined space. Only those employees assigned to that specific Permit are authorized to enter the space.
- 5.18 Prior to commencing work in a confined space, all personnel review the job to ensure the following safety items are considered.
- Check the ventilation required due to heat, vapors from solvents, welding/cutting or deficiency/excess of oxygen.
 - Make sure that low voltage lighting or drop lights with ground fault interrupters are used for all lighting.
 - Ensure all required safety devices, personal protective equipment and rescue equipment is available and used.
 - Ensure that fall protection/ prevention devices are used by individuals working on unprotected sides or edges (i.e., ≥ 6 feet above lower level).
 - If cleaning solvents are used, review the Material Safety Data Sheets (MSDS) with the appropriate supervisor to ensure that the solvents will not pose any toxic or irritant hazards.
 - If hot work is performed, complete a hot work permit and attach it to the confined space entry permit.
- 5.19 Air monitoring of the permit space will be performed prior to entry and continuously to determine if acceptable entry conditions are being maintained during the course of entry operations.
- 5.20 Test sampling results and other aspects of the permit are valid for only one shift duration or the duration of the operation, whichever is less.
- 5.21 When work is completed in the space, the entry supervisor inspects the space to ensure that all personnel, tools, scaffolding, etc. have been removed. If entrants leave the immediate area of the space, he or she must sign the permit. The permit is then canceled. To re-enter a new permit must be issued.
- 5.22 The entry supervisor brings the permit back to the Project Site Office, reports to the Site Supervisor and signs the release section of the Confined Space Entry Permit Log. Only the entry supervisor or his immediate supervisor is authorized to release the Confined Space Entry Permit. After all entry supervisors who control entries into a particular space release their respective permits, the Site Supervisor returns the space to service or takes other appropriate action.

6.0 REFERENCES

- 6.1 OSHA 29 CFR 1910.146 Permit Required Confined Spaces

7.0 ATTACHMENTS

- 7.1 Confined Space Entry Permit
- 7.2 Confined Space Entry Permit Log
- 7.3 Confined Space Entry Sign
- 7.4 Confined Space Entry Permit (pre-Entry/Entry Check List)
- 7.5 WRS Atmospheric Monitoring Log

8.0 RECORD KEEPING

The Site Supervisor will complete the Confined Space Entry Permit (Attachment 7.1) and the Confined Space Permit Log (Attachment 7.2). These documents are to be maintained in the project file for at least one year.

9.0 EQUIPMENT

Equipment will be provided to assure the following functions:

- Testing and Monitoring (%O₂, %LEL and Toxics measurements are mandatory for all CSE Work)
- Ventilation
- Personal Protection
- Communications
- Lighting
- Barriers and shields
- Equipment such as ladders for safe entry and egress
- Rescue and emergency equipment

Standard Operating Procedure**Confined Space Entry****ATTACHMENT 1
CONFINED SPACE ENTRY PERMIT (PRE-ENTRY/ENTRY CHECKLIST)**

Date and Time Issued: _____ Date and Time Expires: _____
Job site: _____ Job Supervisor: _____
Space to be Entered: _____ Purpose of Entry: _____

Pre-Entry (See Safety Procedure)

1. Atmospheric Checks: Time _____
Oxygen _____ %
Flammable/ Explosive _____ %
Toxic _____ PPM

Tester's Name _____

2. Source Isolation (No Entry): N/A Yes No
Pumps of lines blinded. () () ()
disconnected, or blocked () () ()

3. Ventilation Modification N/A Yes No
Mechanical () () ()
Natural Ventilation only () () ()

4. Atmospheric check after isolation and ventilation.

Acceptance Criteria
Oxygen _____ % > 19.5% & < 23.5%
Explosive _____ % L.E.L. < 10% LEL
Toxic _____ PPM
Time _____

Tester's Name _____

If conditions are in compliance with the above requirements and there is no reason to believe conditions may change adversely, then proceed to the Permit Space Pre-Entry Check List. Complete and post this permit. If conditions are not in compliance with the above requirements or there is reason to believe that conditions may change adversely, do not proceed. Contact the WRS H&S Manager.

Description of Hazards associated with this space and the work to be performed: _____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid and entry is not permitted unless all appropriate items are completed.

Permit and Check List Prepared By: _____

Approved By: (Project Manager/ Safety Officer) _____

Reviewed By: (all entrants) _____

1. Entry, Standby, and backup persons: Yes No
Successfully completed required training? () ()
2. Equipment: N/A Yes No
Direct reading gas monitor calibrated? () () ()
Safety harnesses and life-lines for entry and stand-by persons? () () ()
Hoisting equipment? () () ()
Powered communications? () () ()
SCBAs for entry and standby persons () () ()
Protective Clothing? () () ()
All electric equipment listed Class I, Division I, Group D and Non-sparking tools? () () ()

3. Rescue Procedure:

Standard Operating Procedure

Confined Space Entry

This permit is to be kept at job site. Maintain permit in project files following job completion for at least one year.

ATTACHMENT 4

CONFINED SPACE PRE-ENTRY CHECK LIST

Use this checklist for the evaluation of all confined spaces, both permit required and non-permit required, prior to entry.

		Yes	No
1.	Did your survey of the surrounding area show it to be free of hazards such as drifting vapors from tanks, piping or sewers?	()	()
2.	Does your knowledge of industrial or other discharges indicate this area is likely to remain free of dangerous air contaminants occupied?	()	()
3.	Has the air monitoring instrumentation been calibrated prior to use?	()	()
4.	Did you test the atmosphere of the confined space prior to entry?	()	()
5.	Did the atmosphere check as acceptable in comparison to the action limits spelled out in the SOP?	()	()
6.	Will the atmosphere be continuously monitored while the space is occupied?	()	()

Notice: If any of the above questions are answered "no" do not enter. Contact your supervisor.

Project Location _____

Site Supervisor Signature _____ Date _____

CONFINED SPACE ENTRY PROGRAM PERMIT REQUIRED CONFINED SPACE ENTRY LOG

[illegible]

Original Entry Supervisor (if applicable) _____ Date: _____

ATTACHMENT 3

SIGN

**"CONFINED SPACE ENTRY
PERMIT REQUIRED"**



**PERMIT-REQUIRED CONFINED SPACE
DO NOT ENTER**

**AIR SAMPLING AND WORK PERMIT REQUIRED
CONTACT WRS SAFETY DEPT.**

Standard Operating Procedure

Confined Space Entry: Air Monitoring Log

WRS Infrastructure & Environment, Inc.
Air Monitoring Log

Project Site:	Project No.	Date:

Project No.	Level of Protection:

Description of Site (e.g. weather, temp., soil conditions):

Instrument:	Instrument Response:	Location:	Time:	Comments:

Calibration Data (e.g. type & gas concentration, instrument adjustments if any):

Additional Notes:

Signature: _____ Date: _____
(Health and Safety Officer)

Appendix C
Material Safety Data Sheets (MSDSs)

Appendix D
WRS SOP: "Drum Handling"

CONTENTS

1.0 PURPOSE

2.0 SCOPE

3.0 PROCEDURES

3.1 HAZARD RECOGNITION

3.2 ACTIVITY SPECIFIC PROCEDURES

Unknown drum and anomaly excavation

Opening unknown drums

Transferring drum contents

Stacking drums

Transporting empty drums

Drum staging operations

Moving/ lifting drums

Overpacking drums

Overpacks vs. Salvage Drums

Bulking drum contents

Lab Packs

4.0 REFERENCES

5.0 ATTACHMENTS

6.0 RECORDKEEPING

7.0 EQUIPMENT

1.0 PURPOSE

The Drum Handling SOP identifies the hazards and hazard control measures associated with drum:

- excavation;
- opening;
- sampling;
- moving; and,
- storing.

2.0 SCOPE

This SOP applies to all drum handling activities undertaken by WRS personnel and its subcontractors. The SOP also applies to any other container which exhibits a hazardous characteristic which can be diminished by the hazard control measures described in this SOP (e.g. vats, containers, tanks, etc.).

3.0 PROCEDURES

3.1 HAZARD RECOGNITION

Chemical

Chemical hazard classes associated with drum handling can include toxic, corrosive, flammable, and/ or reactive. The degree of hazard posed by drums is typically higher than other environmental media contamination (i.e. contaminated soil & water) due to the confining nature of a drum and higher concentrations of contaminants found in drums (sometimes up to 100%). Accident types associated with drum chemical hazards include:

- exposure by inhalation to gases and/ or vapors;
- exposure by skin contact to corrosives and compounds absorbed through the skin; and,
- fire/ explosion.

Clues to the hazards contained within a drum can be derived from drum configuration and material of construction. Drums configured with:

- removable heads were manufactured to contain solids; and,
- non-removable head drums were manufactured to contain liquids.

Containers with rounded ends were manufactured to contain pressurized materials (i.e. gases)

Drums constructed of :

- carbon steel are typically painted and used to contain non-corrosive liquids (flammable and/or toxic);
- stainless steel or Monel (a nickel alloy) are typically used to contain corrosive liquids (nitric acid);
- plastic are typically used to contain dilute concentrations of corrosive liquids (muratic acid); and,
- cardboard are typically used to contain solids (lime)

Of course the drum may not contain a material for which it was manufactured.

The condition of the drum can provide clues as to the hazard contained within. Bulging drums may:

- currently contain frozen liquids or have contained frozen liquids in the past (indicating an aqueous material);
- currently or in the past been under pressure due to vapors from liquids with high vapor pressures (e.g. flammable liquids);
- currently or in the past been under pressure due to gases from incompatible reactions (e.g. acids mixed with organics or bases)

Physical

Physical hazards posed by drum handling activities are associated with physical attributes of drums including: pressurized contents, weight, and sharp metal edges. Accident types associated with drum related activities can include:

- Struck by & contacted by pressurized releases of drum contents;
- Struck by drum parts (removable heads, rings and bungs) thrown by pressurized releases of drum contents;
- Struck by falling drums;
- Contact with sharp metal parts (chimes, rings, etc.);
- Strain/ Overexertion due to inappropriate lifting techniques and/ or attempting to stop a falling drum; and,
- Caught between drums when loading damaged drums into salvage or overpack drums and when manually moving drums next to one another.

3.2 ACTIVITY SPECIFIC PROCEDURES

Unknown Drum & Anomaly Excavation

Prior to excavation activities, a ground penetrating radar system or other type of detection system will be used to estimate the depth and location of buried drums. Overburden will be removed so as not to damage a drum. All unknown drum and anomaly excavations will be performed in Level B PPE.

Opening Unknown Drums

If the contents of the drums or containers are unknown, Level B protection, as a minimum, will be worn. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents have been identified. If the contents of the drums or containers are known, specific personnel protective equipment will be worn in accordance with the Health and Safety Plan.

The following procedures shall be used when opening drums with unknown contents:

- Before and during drum opening activities, monitoring will be done by means of a PID or FID and combustible gas indicator. Operations will be suspended and the SHSO contacted if the 20% of the LEL is reached. If the contents of a drum are known, the Safety Officer will determine action levels for suspension of activities in accordance with the Health and Safety Plan.
- If an airline system is used, this system shall be protected from contamination and physical damage.
- Only those employees essential to drum opening operations will be in the drum opening area.
- Bulging drums will be placed behind a barrier, or "bomb shield," and opened by means of a remote, automatic drum opener. The worker opening the drums will work behind a separate barrier.

- All non-bulging, non-removable head drums with bungs will be opened slowly to release potential gases and vapors. Rapid removal of a bung on a pressurized drum can result in the opener being splashed by the drums contents or being struck by the bung. The smaller of the two bungs will be opened first because of the higher thread count. If a release of pressure is detected (by sound) once the bung is loosened, step back and wait for drum to vent. Once the drum has vented, remove the bung and proceed. Do not remove the bung all at one time.
- If the bung on a non bulging drum cannot be removed, the drum shall be moved to a segregated area and opened by means of a drum punch.
- All equipment and tools used to open drums will be of the type which is incapable of acting as an ignition source.
- All fire control equipment shall be kept behind the barriers discussed above.
- Employees shall not stand on or work from drums or containers and will not stand over or place hands and arms over a drum.

Transferring Drum Content

When a drum is deemed to be unfit for moving, its contents must be transferred to another container. Drums with unknown content will be assumed to contain hazardous materials and the following precautions will be taken:

- pumps will be air driven double diaphragm, explosion proof or intrinsically safe electric with chemically inert internal parts (e.g. viton, teflon, rubber, neoprene, etc.); and,
- discharge end of the pumping system will be manned to prevent discharge of the drum's contents onto the ground.

All drums containing waste that is to be transported off site for disposal will conform with all DOT regulations including the United Nation's performance oriented package specifications.

Stacking Drums

Maximum height

As with any container, drums have a maximum stacking height which is based on their ability to withstand the weight placed upon them by stacking. Only drums stacked to near perfect vertical, perform to the maximum stacking height. Overstacked and leaning drum stacks cause pallet failure and container failure. Wet, fiber drums are particularly vulnerable to overstacking. Without knowledge of a container's particular stacking height limitations, limit stacking to two drums high.

Palletizing

A palletized drum is easier to move and also can slow corrosion of carbon steel drums which would otherwise be in contact with wet soils. Palletize drums prior to filling to facilitate handling. Palletize and band all drums prior to stacking. Products are available which serve as both a pallet and as secondary containment. Do not use damaged pallets.

Transporting Empty Drums

For purposes of transportation, a drum is considered empty when it has been cleaned, purged of vapors, and no longer exhibits the hazard characteristic(s) it once contained. (i.e. flammable atmosphere due to flammable liquid residues.) Intact, empty drums which cannot be cleaned will be labeled, marked and manifested as if it were a full

drum. If drum cleaning is not desirable, the drum may be crushed and placed in another DOT approved shipping container.

Non-intact drums that meet the definition of RCRA Empty drums will be typically crushed, placed in roll-offs and transported off-site as non regulated waste. Non-intact drums, which do not meet the RCRA Empty definition and have not been cleaned of RCRA/ TSCA/ CERCLA wastes are typically crushed, placed in roll-offs and manifested as a bulk load of hazardous debris.

Drum Staging Operations

Drum staging for segregation of hazard classes, providing secondary containment and preparation for transportation and disposal is a common practice on remediation sites.

When excavating unknown drums the following areas are to be set up on the site:

- excavation area;
- drum sampling cue area (drums in cue should not exceed a quantity that can be sampled by end of the day);
- drum sampling area; and,
- post sampling staging.

When drums with unknown content are to be handled but they are not buried, the following areas will be set up on site:

- drum sampling cue area (drums in cue should not exceed a quantity that can be sampled by end of the day);
- drum sampling area; and,
- post sampling staging area.

Staging areas are to be arranged as follows:

- drums may be placed in rows no more than two drums deep;
- aisle ways between rows of drums will be of sufficient width to allow uninterrupted egress and movement of drum handling equipment;
- do not place leaking drums in the staging area with other drums, instead, segregate the leaking drum so that it does not impact intact drums; and,
- labels on drums must face into the aisle way.

Individual drums to be sampled will be segregated from all other site activities during sampling. Once sampling is complete, the drum may be staged with drums which have already been sampled.

Moving/ Lifting Drums

Site operations will be designed so that container movement is minimized. Drums which cannot be moved without rupture, leakage or spillage will be emptied into a second container.

Drum lifting devices and their uses include:

Type	Pros	Cons
single sling	good for moving drum from one location to another	not to be used for overpacking
double sling	good for overpacking	if drum is out of round, may be difficult to remove slings
hydraulic grappler (trac hoe mounted)	good for moving drums which are already damaged	typically damages drums, awkward for overpacking
mechanical: chime gripping/ lift activated ("hooks")		chimes which are bent or corroded may fail and allow the device to drop the drum
mechanical: chime gripping, cam locking	can handle drums which are minimally out of round	
mechanical: rib gripping, lift activated, forklift mounted		drums which are bent or corroded may fail and allow the device to drop the drum

Lifting devices are rated for the weights they can lift and some specify that they may or may not be used for removable and non-removable head drums. Lifting devices used, must be rated to handle the anticipated lift.

To avoid being struck by a drum as it is lifted, position the lifting device around the drum, step back from the drum and signal the operator to make the lift. As with any lifted load, do not get close enough to the lifted drum to put your hands on it.

Placing Drums in Overpacks and/ or Salvage Drums

Drums to be overpacked must be placed in an overpack so that the top of the inner drum is in the up position prior to shipping to a TSD. Placing drums into overpacks/ salvage drums poses the following hazards:

- ground crew members can be struck by drums which swing as they are lifted with slings;
- ground crew members can be struck by drums that fall from the sling or other lifting device;
- hands and fingers are at risk of injury by pinch points as ground crew members attempt to place a drum into an overpack with a single sling.

To avoid pinch points, do not place hands/ fingers in the overpack while inserting the drum. To avoid being struck by a drum as it is lifted with a sling, position the sling around the drum, signal the operator to take the slack out of the sling, step back from the drum and signal the operator to complete the lift. As with any lifted load, do not get close enough to the lifted drum to put your hands on it.

Overpacks vs. Salvage Drums

There are differences between overpacks and salvage drums. The overpack regulations can be found in 49 CFR 173.25, and the salvage drum regulations can be found in 49 CFR 173.3(c).

Overpacks are used by a shipper in order to provide protection or convenience in handling a package or to consolidate two or more packages. Containers of hazardous materials within an overpack must not be damaged and must meet the DOT's performance oriented packaging standards. Overpacks must be marked with the proper shipping name and identification number (UN or NA number), and labeled for each hazardous material inside the overpack. The containers inside the overpack must be UN approved, secured and cushioned to prevent breakage.

There should also be absorbent inside the overpack in case there is breakage. The overpack can not be filled with a quantity that is greater than what is marked on the overpack. If there are liquids inside the overpack, the container must be placed with the closure upright and there must be orientation arrows on the outside of the overpack. The overpack must be marked with the statement "INNER PACKAGES COMPLY WITH PRESCRIBED SPECIFICATIONS". Labels with the previous statement printed on them can be purchased from companies such as Labelmaster or JJ Keller. Class 8 (corrosive) packing group I or Division 5.1 (oxidizers) packing group I can NOT be overpacked with any other material. The inner package(s) must also be labelled and marked.

Salvage drums are used when a package or packages of hazardous materials are damaged, defective, or leaking. The salvage drums may be metal or plastic with removable heads. The salvage drums must be UN approved and must be compatible with the material inside the damaged drum. There must be sufficient cushioning to prevent excessive movement of the damaged container and sufficient absorbent material to eliminate the presence of free liquids at the time of drum closure. The cushioning and absorbent must be compatible with the hazardous material. The salvage drum must be marked with the proper shipping name, the address of the generator, and the words "SALVAGE DRUM". The salvage drum must also be labeled for the material inside the damaged drum. The inner package must be labelled and marked.

Waste Stream Bulking Operations

Drum contents will be bulked together only after they have been characterized and lab scale compatibility testing has been completed. Level B PPE will be used by ground crew members during bulking operations.

Lab Packs

The phrase "lab pack" is used to describe a container which is loaded with a collection of smaller containers and sometimes an absorbent/ cushioning material such as vermiculite. The containers within the lab pack may or may not contain chemicals from a laboratory. Lab packs are assembled by generators of hazardous waste to make disposal of a large number of small containers cost effective. When assembled correctly lab packs contain chemicals which are compatible with each other and do not react with one another if broken and contents are released.

Hazards associated with the containers within a lab pack are the same chemical hazards associated with any chemical container (i.e., flammable, corrosive, toxic, reactive and various hazard combinations). The risk of encountering these hazards when opening small containers can be greater than when opening large containers for the following reasons:

- high hazard materials (e.g., shock sensitives, and water & air reactives tend to be stored in small containers); and,
- the close contact that occurs when using your hands to remove lids increases risk of exposure.

As a result the following special handling procedures apply to lab pack handling:

- remove all non-essential personnel to safe distance from handling operation;
- when possible use a grapppler unit constructed for explosive containment for initial handling;
- maintain continuous communication with Site Safety Officer until handling operations are complete;
- once a lab pack has been opened, have a chemist or other qualified personnel (e.g. individual with university level chemical laboratory training) inspect, classify, and segregate the containers within it, without opening them, according to the hazards of the wastes;
- if crystalline material is noted at the neck of any bottle, handle it as a shock sensitivewaste, due to the potential presence of picric acid or other similar material and get expert advice before attempting to handle it

- other container signs of potentially high hazard material include: sheet metal cans with plastic screw on lids - potentially contain organic peroxides which can be shock sensitive; any container labelled as containing peroxides; glass containers which contain solids stored under liquid could contain air/ water reactives such as sodium; and,
- it is recommended that small containers that are complete unknowns due to lack of container markings/ labels not be opened for sampling.

Re-packing lab packs for disposal is to be done at the direction of the disposal facility(s).

4.0 REFERENCES

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

5.0 ATTACHMENTS

None

6.0 RECORDKEEPING

Drum Logs

HAZCAT results

7.0 EQUIPMENT

Specified within the SOP